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ABSTRACT

Adopting and addressing the use of technology by counselors and by counselor educators is not a new task that has emerged with the creation of the Internet. Some of the attitudinal barriers to the adoption of technology are identified. Barriers such as resistance to change or cyberphobia; lack of resources and support; time constraints; learning styles and technology styles; and larger system issues are discussed. Approaches to teaching; pairing novices with experts; one-on-one support; achievable developmental competencies for guidance; and counselor and client incentives need to be emphasized to make technology use more attractive and real to the counselor or counselor educator. This article explores the contemporary definition of a counselor Luddite, looks at scales used to measure attitudes toward computers, and suggests obstacles and ways to overcome them in working with technology-resistant counselors and counselor educators. (Contains 69 references and 2 tables.) (Author)

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Converting Counselor Luddites: Winning over Technology-Resistant Counselors

by
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Chapter Five

Converting Counselor Luddites: Winning over Technology-Resistant Counselors

Marty Jencius and Susan Paez

Computers have become an intrinsic part of our daily interactions in academia. Universities, professors and students have been introduced to all the creative possibilities these advancements in technology can offer. Along with the creative possibilities come the challenges and frustrations of these new technological developments. This chapter will explore the contemporary definition of a counselor Luddite, look at scales used to measure attitudes toward computers, and suggest obstacles and ways to overcome them in working with technology-resistant counselors and counselor educators.

Establishing a Definition of a Counselor Luddite

Current counselor resistance to technology can be compared to historic resistance to technology. Technology-resistant counselors can be considered the Luddites of the profession. The Luddite movement had its origins in England in the early 1800's with a group of textile workers who felt that the Industrial Revolution threatened their jobs (Barron, 1996; Ryder, 2002).

Some say they were led by a Charles Lud while others say by a Ned Lud, who in his clumsiness, broke two knitting looms. Soon, anytime factory owners found their equipment damaged they would attribute it to "poor Ned Lud". Inspired by the revolutionary spirit of the times and the social writings of Thomas Paine, Luddites created a small band or "army" around Nottingham and could disappear into the woods when threatened by British troops. They would come to offending factories and state that they had come on the orders of "General Ned Lud" and demand the restoration of decent wages, quality control on products, and reasonable working conditions. Faced with this much opposition, factory owners would comply without violence. Their non-violent means came to an end with a fatal attack on Burton's power loom mill in Lancashire on April 20, 1812, in which British soldiers killed many Luddites. The British government suppressed the movement by making machine-breaking a capital punishment and executing 17 violators in 1813.

Thompson (1966) advances arguments that Luddites were not unorganized, reckless, and opposed to all technology. He claims that they were opposed more so to the factory owners and the conditions that technology produced. Neo-Luddites, like their predecessors, share the same concerns about technology alienating people but unlike their predecessors embrace computer technology (Davenport, 1997). They see the personal computer as the great emancipator in relationship to owner entrepreneurship. Counselors who are struggling with embracing technology but are not resistant to technology may have similar attitudes as modern day Luddites.

Contemporary counselor Luddites have an impact on those around them. Olsen (1999) reports that in a survey of information technology specialists, 40 percent reported that helping reluctant faculty members bring technology into their teaching was the hardest part of their job. One can imagine that a parallel process occurs in introducing reluctant counselors to technology. In the case of faculty, many have ceded to their students' ability to handle technology. This creates what Olsen reports as a new kind of "oedipal aggression" in the classroom with students checking information on the Internet and challenging teachers about the accuracy of their information. The similar case could be made that many counselors have ceded to their clients' ability to handle technology. A client can be easily versed in types of therapies, the diagnosis of disorders, or the latest medications, and challenge the counselor's information and approach.

Counselor Luddites, along with Rogers' (1995) late adopters, want technology support, generally on a one-on-one basis, to work with proven applications with low risk of failure (Jacobsen, 1997). Skepticism plays a role in Luddism (Albaugh, 1997). As professionals, counselors would be reluctant to adopt technology with suspicious new claims. They may see technology as nothing more than "computer games" and lacking the personal touch that counseling traditionally provides. George and Camarata (1996) point to the role that self-efficacy plays in the Luddite's adoption of technology and provide a method for reducing anxiety in cyberanxious individuals. Fabry and Higgs (1997) point out that not much time is available for learning new technology skills when considering professional workloads and pressures. Counselor Luddites would require time to experiment with technology, share experiences with counselor colleagues, and attend technology-related training.

Preparation Standards and Student Types

Current curriculum standards for training counselors do nothing to reduce the Luddism among the profession. Counselor training curriculum does not typically incorporate technology across the process. Although the

use of technology is encouraged as part of Council for Accreditation of Counseling and Related Educational Programs (CACREP) accredited counseling programs, the CACREP standards do not speak specifically to the need for counselor trainees to emerge from a degree program being able to demonstrate particular technology capabilities. In teacher training programs that are accredited by National Council for Accreditation of Teacher Education (NCATE), teacher candidates are expected to be able to demonstrate the core International Society for Technology in Education (ISTE) standards. If technology is included as part of counselor training, it is included idiosyncratically and as part of a particular instructor's teaching agenda. The instructor attempting to include technology in the classroom is often greeted by students bringing their own technology resistance.

One could imagine at least three kinds of technology-resistant counseling students - the traditional student, the returning student, and the returning counselor. The traditional student may have gone straight through an undergraduate program and managed to avoid technology requirements in his or her previous educational processes; however, those coming from a teaching background from NCATE-accredited programs should have mastered basic ISTE core, standards although that curriculum requirement is not equally employed across all teacher-training programs. We have found that in many cases teacher technology training as part of a teaching degree can be dated and not take into consideration advancements in video-streaming and Internet-based synchronous technology like chat rooms.

The second kind of technology-resistant student is the returning student who did not have much exposure to computer technology during her or his initial undergraduate degree program. This student can be apprehensive about all kinds of technology due to being unfamiliar with computers. Technophobic returning students will often try to look at non-technology alternatives to classroom assignments instead of trying to adapt to the new technology.

The third kind of technology resistant student could be the returning professional counselor who is taking additional hours for recertification. These students would have similar concerns and potential weaknesses as the returning student. Their absence from the educational system may have limited the development of their technological capabilities, but if their counseling worksite had widespread use of technology they may have maintained current skills through computer exposure at work.

Attitude Scales

Understanding the attitudes students have toward computers is a decisive factor in the development and evaluation of computer-based curricula (Woodrow, 1991). While attitudes toward computers may impact the acceptance of computers, they can also influence potential activities such as using computers as a professional or educational device (Anderson, Hansen, Johnson & Klassen, 1979). With this in mind, it is vitally important to assess and promote positive attitudes toward computer use in the classroom setting. Counselor educators can play an important role in decreasing negative attitudes and anxiety that may stand in the way of students appreciating the innovative potential computers can have on the process of learning.

The Minnesota Computer Literacy and Awareness Assessment Scale (MCLAA) was one of the first instruments developed to assess attitudes toward computers (Woodrow, 1991). This instrument contained twenty items that utilized a Likert-type scale to measure attitudes towards computers. Other researchers have developed computer attitude instruments that contained modified items from the MCLAA (Chen, 1986; Swadener & Mannaflin, 1987).

Instruments have also been developed that measure several different elements in relation to attitudes toward computers. For instance, some instruments reveal the importance positive experiences with technology have on one's attitude toward computers (Bear, Richards & Lancaster, 1987; Byrd & Koohang. 1989; Levin & Gordon, 1989). Other research has focused on gender and attitudes toward computers (Busch, 1995; Shashaani, 1994). Loyd and Gressard (1984a) utilized a thirty-item scale to assess the computer attitudes of male and female teachers enrolled in a computer development course. Results indicated that males possessed a more positive attitude toward computers when compared to their female counterparts.

Scales have also been developed to investigate the computer attitudes of students and teachers (Kleuver, Lam, Hoffman, Green & Swearingen, 1994; Woodrow, 1994). Marshall and Bannon (1986) constructed an eighteen-item scale to assess teachers' and students' attitudes toward computers. The results indicated that age was positively correlated with a positive attitude toward computers for both groups. In addition, educators presented a more positive attitude toward computers than their students.

Factors Associated with Computer Attitudes

In an examination of computer attitude scales, Woodrow (1991) proposed that there are several components that contribute to the attitudes an individual possesses toward computers. These attitudes can be found

across the affect and the cognition of a person. Bear and colleagues (1987) employed computer use, computer attitude, history, social issues, and programming as the five elements that made up their computer attitude scale. Computer interest, computer confidence, computer anxiety, respect through computers, and gender equality in computer use were the dimensions that Chen (1986) utilized in the construction of a different computer attitude scale. An investigation focusing on three attitude domains - behavior, affect, and cognition - was also completed by Reece and Gable (1982).

Computer Attitude Scale (Loyd & Gressard, 1984a)

As the implementation of computers in the classroom and the counseling profession continues, it will be important to assess the computer attitudes of students. Instructors can utilize quick and efficient instruments to help measure students' attitudes towards computers. The use of a scale that is valid and reliable, as well as short in length and easy to administer, would be ideal.

The Computer Attitude Scale (CAS) (Loyd & Gressard, 1984a; 1985) is becoming the instrument of choice when researching the topic of attitudes toward computers (Nash & Moroz, 1997). It has been found to have factors that are empirically sound (Loyd & Gressard, 1984b) and has been utilized with a variety of adult populations. This instrument has been used in research with professional educators (Loyd & Gressard, 1986; Roszkowski, Devlin, Snelbecker, Aiken & Jacobson, 1988) and high school counselors (Stone, Thompson, & Lacount, 1989). Researchers in the adult education (Massoud, 1991), health, and banking fields (Henderson, Deane, Barrelle & Mahar, 1995) have also used the CAS.

A variety of rationales exist for the studies. Some use the CAS in a quasi-experimental setting to assess the value and power of educational experiences with computers (Massoud, 1991; Pope-Davis & Vispoel, 1993). Additional studies using the CAS have focused on independent variables such as age (Loyd & Gressard, 1984b; Dyck & Al-Awar Smither, 1994), gender (Busch, 1995; Chen, 1986; Shashaani, 1994; Loyd & Gressard, 1986) and computer experience (Byrd & Koohang, 1989; Levin & Gordon, 1989). Investigations have also assessed computer anxiety, computer liking, computer confidence (Loyd & Gressard, 1986; Massoud, 1991; Pope-Davis & Twing, 1991), and perceived computer usefulness (Pope-Davis & Twing, 1991) using the CAS.

Psychometric Properties of the CAS

The original form of the Computer Attitude Scale contained 30 items that offered statements of attitudes toward computers and the use of

computers. Loyd and Gressard (1984a) reported that this instrument was an effective and reliable measure of attitudes toward learning about computers and the use of the technology. In 1985, Loyd and Loyd (1985) added a fourth scale, computer usefulness, to the CAS.

The second version of the CAS (see Figure 1) consists of 40 items that contain statements regarding attitudes toward computers and their use. Subjects respond to the items using one of four ordered responses ranging from strongly agree to strongly disagree. Four central attitudes create the four distinct categories of the CAS including anxiety or fear of computers, liking computers or enjoying working with computers, perceived usefulness of computers in present or future work and confidence in ability to use or learn about computers (Loyd & Loyd, 1985).

The CAS also has the following four subscales containing ten items apiece. Each subscale contains positively and negatively worded items distributed through out the assessment tool. Items on the Computer Anxiety subscale include statements such as

1. Computers do not scare me at all and,
13. I feel aggressive and hostile toward computers.

The Computer Confidence subscale contains statements like

14. I am sure I could do work with computers and,
2. I'm no good at computers.

Typical statements on the Computer Liking subscale include

27. Once I start to work with the computer, I would find it hard to stop and,
39. I do not enjoy talking with others about computers.

Finally, the Computer Usefulness subscale has items like

28. Knowing how to work with computers will increase my job possibilities and,
8. Learning about computers is a waste of my time (Loyd & Loyd, 1985).

The coefficient alpha reliabilities are .90 for the Computer Anxiety, .89 for the Computer Confidence, .89 for the Computer Liking, and .82 for the Computer Usefulness subscales (Loyd & Loyd, 1985). The Total Scale reliability was estimated at .95. The Computer Attitude Scale is considered a reliable and valid instrument for assessing attitudes toward computers (Loyd & Loyd, 1985).

Other Scales of Computer Attitude

Surveying the literature we found a series of attitude surveys on computer use. Following is a brief description of the instruments. See Table 1 for reference locations.

Affective Attitude Measure

The Affective Attitude Measure contains eighteen semantic differential items that reflect affective reactions to characteristics of computers. The scale ranges from 1 to 7 with 1 representing positive reaction, such as "easy" and "understandable" and 7 indicating a negative attitude, such as "confusing" and "difficult." The reliability coefficient for the eighteen items on this measure is 0.79 (Levin & Gordon, 1989).

Attitude Survey

Misfeldt and Stahl (1991) developed the Attitude Survey to explore student attitudes related to computers. The instrument is composed of 30 questions and utilizes a five point Likert scale. Students are given options that range from strongly agree to strongly disagree. The survey is divided into four categories: pedagogy, administration, social impact and equity.

Attitude Toward Computers

The Attitude Toward Computers scale (ATC) was developed to measure computer anxiety and other computer related attitudes. Specifically, this instrument measures computer usage, societal impact and computer appreciation (Raub, 1981). Raub described computer anxiety as a form of "state anxiety" in which the computer is a "personally threatening" stimulus. After additional research, the author identified the multidimensional elements of computer anxiety as anxiety concerning the negative impact of computers on society, computer usage anxiety, and lack of appreciation for computers.

Attitudes Towards Computers

Reece and Gable (1982) constructed a ten-item scale entitled Attitudes Towards Computers. The authors attempted to sample individual attitudes toward computers across affective, behavioral and cognitive domains. This instrument has a reliability of 0.87.

Bath Attitude Survey

The Bath Attitude Survey contains twenty-six items that inquire about computers in general (Bear, Richards, & Lancaster, 1987). The reliability for this instrument is instrument 0.94.

BELCAT

The Blomberg-Erikson-Lowrey Computer Attitude Task (BELCAT) assesses attitudes toward learning about computers and toward computers (Erikson, 1987). This Likert-type self-report measure was based on Fennema and Sherman's Mathematics Attitude Scale (Fennema & Sherman, 1977). The instrument consists of five subscales: Comfort with Computers, Computer Liking, Computers as a Male Domain, Attitudes Toward Success with Computers, and Usefulness of Computers.

Computer Anxiety Index

Montag, Simonson and Maurer (1984) developed the Computer Anxiety Index (CAIN). This instrument examines the avoidance of, caution with, disinterest in, and negative attitudes toward computers. The instrument consists of 26 statements.

Computer Assisted Instruction

The Computer Assisted Instruction (CAI) instrument was developed with the purpose of assessing student attitudes toward computer-assisted instruction (Morrell, 1992). The survey contains 20 questions based on a 5-point Likert scale.

Computer Attitude Scale

The Computer Attitude Scale consists of twelve items that assess computer usefulness (Byrd & Koohang, 1989). The reliability for this measurement is 0.86.

Computer Survey

The Computer Survey contains eleven items that inquire about computer attitude and anxiety (Stevens, 1980).

Computer Use Questionnaire

Griswold (1983) developed the Computer Use Questionnaire. This twenty-item measurement inquires about computer awareness. This instrument has a reliability of 0.75.

General Attitude Measure

The General Attitude Measure consists of twenty-two statements about computers based on a 5-point Likert scale. The options range from 1, which represents strong disagreement, to 5, which represents strong agreement (Enochs, 1984). The twenty-two items are divided into four attitude factors. The first factor, desire to become familiar with the computer, has a reliability coefficient of 0.72 on six items. Range of capable users, the second factor,

has a reliability of 0.44 for four items. Factor three, the need for computers in our lives, has a reliability of 0.62 for its four items. Finally, a reliability of 0.77 is noted for the five items for factor four, the computer as an instructional medium.

MCLAA

The Minnesota Computer Literacy and Awareness Assessment (MCLAA) instrument was one of the first measures developed to assess attitudes towards computers (Woodrow, 1991). This Likert-type scale instrument contains twenty items and has a reliability of 0.93.

Perceptions of the Computer's Functional Capabilities Questionnaire

The Perceptions of the Computer's Functional Capabilities Questionnaire was developed to focus on specific functions students might perceive computers as capable of performing (Levin & Gordon, 1989). The measurement contains a list of twelve activities ranging from robotic and mechanical tasks such as "administering injections" to cognitive and creative tasks such as "playing chess." Those being administered the instrument are asked to indicate whether they believe a computer could or could not perform the activities (Levin & Gordon, 1989). The reliability coefficient is 0.55 for the twelve items on this measure.

Student Survey

Norales (1987) developed the Student Survey. This measurement consists of twenty items that assess the efficacy and usefulness of computers.

Obstacles to Changing Attitudes

According to Fabry and Higgs (1997), four obstacles stand in the way of effective use of technology in the classroom. These include teachers' attitudes and resistance to change, concerns about funding, training deficiencies, and inadequate access to technology. Teachers report that in order for this change to take place, they need support from administration, sufficient funding, training on the technology and time to implement the changes into the curriculum and the classroom. Perhaps the most fundamental and noteworthy barrier to the implementation of technology is an innate dislike for change. Hodas (1996) suggests that the structure of schools and the nature of teaching have not been changed for hundreds of years. As a result, any type of procedure or alteration that may threaten to "shake up" the steady and constant nature of schooling is perceived as a threat and will result in enormous conflict and resistance.

Ideally, schools attempt to i: .egrate change into the environment in a manner that produces the least amount of commotion (Budin, 1991). In order for the integration of technology into classrooms to take place, teachers will need to make two essential changes. First, they must learn how to use the technology. Second, in order to implement the use of technology, they must basically change the way they instruct their students. Teachers are being asked to move toward a more student-centered classroom rather then a teacher-centered classroom. This transition represents a more challenging obstacle for teachers than simply using technology (Means & Olson, 1995).

Besides the basic resistance to change, Marcinkiewicz (1994) suggests that people stay away from computers because they are apprehensive of the loss of status and hard-earned abilities and do not have adequate knowledge and proper training. Budin (1991) supports this opinion and states that there has been an increase in teacher anxiety since computers have been introduced into schools. The main concern some teachers have regarding computers is how technology will impact their work and student learning. Other teachers express concern that computers will one day replace them. Still others feel self-conscious and embarrassed that they are not quite as knowledgeable or "up-to-date" on new technology as their students may be. As a result, teachers feel deterred from acquiring the necessary skills to effectively implement and use computer technology in the classroom (Hodas, 1996).

The way in which change takes place greatly influences success. Integrating technology use into the classroom requires a collaborative effort by all those involved in the educational system. Regrettably, when it comes to the implementation of technology in the classroom, computers have, in general, been a mandatory requirement of the system. They have been forced into the classroom, not as a tool to complement and enhance the curriculum, but rather as an end unto themselves (Young, 1991). Additionally, when such administrative directives come down, proper training and support for teacher - a key element in facilitating success - is often neglected (Paul, 1994; Means & Olson, 1995).

Individual obstacles

Cyberphobia. Phobias often create anxiety that cause individuals to isolate themselves in an attempt to avoid experiencing humiliation in the public arena. A likely reaction for some is to find support in a secluded place, far away from the condemnation of others. Others prefer to gain reassurance and encouragement from people who experience the same sense of nervousness about technology (George & Camarata, 1996).

Computer anxiety or *cyberphobia* is described as a person's propensity to experience restlessness or anxiety over the use of any technology related to computers. Those who are opposed to the use of technology may experience general anxiety. An individual who is anxious about technology is not necessarily rejecting technology or opposed to learning how to use it. It is more likely that the individual is trying to avoid taunting or even unsupportive comments from peers who may have more experience and knowledge with the hardware or software (George & Camarata, 1996).

A variety of elements can contribute to the lively struggle associated with changes and advances in technology. Individuals can perceive themselves as incompetent and can also rationalize that familiarity with the new advancements is not always necessary. Finally, the frustration one experiences can also contribute to the resistance associated with technological change (Bird, 1991).

Technology resources. In recent years several studies have been conducted concerning the use of computer technology. Two factors that appear to greatly impact teachers' use of computers are administrative support and encouragement as well as teacher training (Stanley, Lindauer, & Petrie, 1998). Support from administration could include serving as a model and showing eagerness for the technology, making necessary equipment available, and offering verbal support (Stanage, 1996). Teacher training could consist of participation in college computer courses, peer training, and staff development programs (Evans-Andris, 1996).

According to Blumberg and Greenfield (1986), the principal is the key component to technological advancement in the education arena. Martin (1996) noted that strong leadership is associated with effective schools and the principal is the change agent in this process. Thus, the principal is an essential component in setting the stage for the implementation of technology in the educational environment.

When looking at staff development, Guskey (1986) suggested certain factors were helpful in introducing computers into schools. Principals supporting computer education, the availability of equipment, as well as individually guided instruction were found to be important elements for teachers. Ayersman (1996) asserted that individuals experience a much lower level of anxiety around computers if they have had previous experience or interaction with the technology.

Parker (1997) used results from his research to support the increased use and advancement of technology and to develop a strategic plan for a university. This overall plan required cooperation and support from all faculty, staff and administrators to increase finances, and provided faculty

development opportunities. The strategic plan included: a) obtaining additional software and hardware, b) finalizing the networking of faculty and lab computers, c) adding to the accessibility of the computer lab, d) offering further support for personnel, e) providing additional opportunities for faculty to receive technology training, and f) enhancing the faculty's knowledge of the opportunities to use technology as an instructional tool.

Time constraints. Quick and Davies (1999) conducted research to find out what faculty members wanted to accomplish in the development of curriculum and what support they needed in order to obtain those goals. When participants were asked, "What do you need in order to accomplish your instructional wants and needs?" a common answer was *time*. More powerfully stated, "Well, if you can put more hours in a day that would be great. I feel overwhelmed by the workload" (p.648).

Learning Styles and Technology Styles. Inquiring how specific types of technology impact the learning styles of students and utilizing that information when developing a course offers a theoretical explanation for the method (Grasha & Yangarber-Hicks, 2000). Learning style is an important element that should be taken into consideration when using technology in the educational environment. Learning style preference and student performance go hand in hand when faced with technology in the classroom (Dille & Mezack, 1991).

While students have an assortment of learning styles, the styles range in varying degrees. Some students are independent learners, whereas others may prefer more collaborative approaches. Due to life and educational experiences and even genetic make-up, some learning styles are more dominant and developed and as a result, are more frequently favored. Other styles, while somewhat undeveloped, can begin to flourish with the right amount of encouragement and support (Grasha & Yangarber-Hicks, 2000).

The "middle ground" or the relationship between technology and learning style is exemplified by Ross and Schulz (1999). They suggest that the method in which course information is displayed and assignments are organized can tap into students' various social, thinking and sensory styles. Ross and Shulz (1999) suggest that the most practical approach to online teaching is to design a course that uses a variety of formats to deliver the information and assignments. By utilizing this approach, students will be able to retrieve and understand the information the teacher is trying to present in a way that matches their style of learning.

System Obstacles

Quick and Davies (1999) noted that faculty members were very interested in having the latest, most up-to-date software to use. Many shared their interest in using new software in order to develop slide presentations and interactive applications for their students in and outside the classroom. Instructors placed high priority on having the same type of technology in their classrooms and computer labs as they did in their offices in order to best utilize the technology (Quick & Davies, 1999).

In summary, a search of the literature notes a variety of obstacles to changing attitudes regarding the use of technology in the classroom. Some barriers include teachers' attitudes and resistance to change, training deficiencies, inadequate access to technology and concerns about funding. Additionally, anxiety surrounding the use of technology (cyberphobia), technology resources, and the relationship between learning styles and types of technology raise questions and concerns for individuals who are trying to incorporate technology into their classroom. Finally, factors such as time constraints and the availability of consistent computer technology and software in the office and classroom have been discussed as hurdles to changing attitudes concerning the use of technology in the classroom.

Strategies for Changing Luddite Attitudes

Suggested strategies for reducing computer anxiety and increasing self-efficacy exist. Jencius (2000a) describes the Technology Competencies Matrix (TCM) and methods of infusing technology into a technology-resistant curriculum (Jencius, 2000b). The TCM uses International Society for Technology in Education (ISTE) standards as a benchmark for counselor and educator technology standards. Since much of the literature points to the developmental nature of change in moving Luddites to technology adopter status, the TCM incorporates developmental learning stages into the absolute guidelines that ISTE provides. Jencius (2000b) also points to how the developmental matrix allows personal latitude in adopting new technology, so that the counselor or teacher may learn in-depth along one technology or learn broad-based across many types of technology. Currently the Association for Counselor Education and Supervision (ACES) is in the process of revising its Technology Competencies for Counseling Students (http://www.acesonline.net/competencies.htm) to make them inclusive of more counselors and to incorporate selected developmental aspects of learning in the format so that those with varying levels of expertise can demonstrate success.

George and Camarata (1996) delineate instructor typologies with implications for how to move through the various typologies to the expert level. Their developmental process is based on the parameters, knowledge of new technology, and use of technology in classrooms (resisting, accepting, and demanding). They suggest typology groupings including the novice, skeptic, and agnostic that fill three cells from low to high knowledge in the resisting category. The optimist, squatter and conformist fill three cells from low to high knowledge in the accepting category, and the explorer, dabbler and expert comprise three cells from low to high knowledge in the demanding category. They suggest the novice needs an increased awareness about the benefits of and training in the use of technology and that the expert can be a great role model for the novice. They suggest that the skeptic and agnostic continue learning about the use of technology in the classroom and that adopters acculturate the skeptic and the agnostic so they see that technology use is the norm in that environment.

Wedman and Strathe (1985) provide a comprehensive and systematic description of the development of technology adoption by examining three dimensions of concerns held by adopters (information, exploration, utilization and collaboration and innovation), the context in which the technology is used (instructional, creative, management, and personal), and the organizational level (individual, groups, departments and colleges or organizations). Their three-dimensional cube provides persons attempting technology adoption with a comprehensive, structured plan.

Beyond having competencies in place and a strategic plan for the technological development of counselors and teachers, other means to increase the adoption and use of technology exist. Stanley, Lindauer and Petrie (1998) studied factors that increased an instructor's use of computer technology. Three factors emerged that significantly influenced instructors to use technology: their participation in in-service activities, having administrators provide computer-related staff development, and having administrators give verbal encouragement for the use of technology. Clearly, for novices or skeptics encouragement by administrators, including modeling by administrators, is a critical factor in establishing norms around the use of technology.

Spotts and Bowman (1993) looked at other incentives involved in getting faculty to use technology. Highly rated was release time to learn *and use* technology, student help, clerical support, stipends, and contributions to promotion, tenure and merit pay. Each was viewed as being "very critical" by 20 percent or more of the participants in the study.

Proposed Changes in Training Programs

Regarding counselor training, proposed changes to improve computer use include advancing computer use throughout the curriculum, establishing professional association and accrediting body technology competencies, and considering counselor education student learning incentives. Each proposed change has implications throughout the curriculum.

Infusion of technology throughout the counselor education curriculum would be an ambitious but potentially rewarding undertaking. Counselor educators who infused multicultural competencies into the curriculum over the last decade can certainly do the same with technology competencies. Just as counselor educators raised the question, "How does culture affect my content areas?" they could use a parallel thought process and ask "How does technology impact my content areas and how should I be able to introduce these concepts into the curriculum?" The use of many computer-based case note and client tracking systems is becoming standard in many agencies. Technologically savvy counselors need to have skill accessing and using databases that differ from the current educational standard of hand-written case notes.

In the 2001 Council for Accreditation of Counseling and Related Educational Programs (CACREP) standards, technology was introduced in a fashion that does not specify competencies, instead counselors should be adequately prepared to use technology applications in various content areas specific to disciplines such as school, marriage, and research. The authors call for a grander infusion of technology competencies into the counselor curriculum perhaps patterned on the ACES Technology Competencies or ISTE standards. This would elevate the use of technology and its part in counseling curriculum to a level that meets current professional clinical practice.

Educational incentives in technology use are seen from a counseling student's perspective. Using technology, students can time-shift aspects of their course. The lead author has used CD-ROM technology extensively to deliver course content via audio lecture with slides. Each student is given a supplemental CD-ROM for the course and is expected to listen to and watch the lectures prior to class. With technology in hand, students can access lecture material anytime they wish. Students report they appreciate the flexibility of the content delivery that permits them to complete assignments outside normal classroom hours. Additionally students report they can easily review material whenever they wish simply by returning to the CD-ROM. They also report flexibility in starting and stopping the lecture so they can review and absorb the content at their own pace. Inadvertently, but to the

author's delight, once the lecture was taken out of the classroom he was forced to focus more on skill development during class time. Students enjoyed the shifting of the teaching to a participatory active learning process, different from the lecturing mode, and they did not loose any of the content by doing so; it only reinforced what they had learned from the lecture. Clearly technology had transformed the classroom, but it had also transformed the student learning process.

Summary and Conclusion

Adopting and addressing the use of technology by counselors and by counselor educators is not a new task that has emerged with the creation of the Internet. For example, the use of telephone crisis lines created quite an ethical practice dilemma for counselors in the 1960s (Wilson, Jencius, and Duncan, 1997). Since that time we have been able to identify some of the attitudinal barriers to the adoption of technology, some of the same factors associated with adjusting to any change (George and Camarata, 1996). Barriers such as resistance to change or cyberphobia, lack of resources and support, time constraints, learning styles and technology styles, and larger system issues were discussed. Approaches to teaching, pairing novices with experts, one-on-one support, achievable developmental competencies for guidance, and counselor and client incentives need to be emphasized to make technology use more attractive and real to the counselor or counselor educator. It is encouraging to think that we are able to work with our Luddite colleagues to help them become more engaged in the use of technology.

References

Albaugh, P. R. (1997). *The role of skepticism in preparing teachers for the use of technology.* (ERIC Document Reproduction Service N. ED406339)

Anderson, R. E., Hansen, T. P., Johnson, D. C. & Klassen, D. L. (1979). Instructional computing: Acceptance and rejection by secondary school teachers. *Sociology of Work and Occupation, 6*, 227-250.

Ayersman, D. J. (1996). Effects of computer instruction, learning style, gender, and experience on computer anxiety. *Computers in the Schools, 12*(4), 15-30.

Barron, D. D. (1996). The Luddites are coming! Are we ready? Are they us? *School Library Media Activities Monthly, 13*(2), 48-50.

Bear, G. G., Richards, H. C., & Lancaster, P. (1987). Attitudes toward computers: Validation of a computer attitudes scale. *Journal of Educational Computing Research, 3*, 207-218.

Bird, J. (1991). Overcoming technofear. *Management Today*, 86-87.

Blumberg, A. & Greenfield, W. (1986). *The effective principal: Perspectives on school leadership.* Boston: Allyn and Bacon.

Budin, H. R. (1991). Technology and the teacher's role. *Computers in the School, 8*, 15-26.

Busch, T. (1995). Gender differences in self-efficacy and attitudes toward computers. *Journal of Educational Computing Research 12*(2), 147-158.

Byrd, D. M. & Koohang, A. A. (1989). A professional development question: Is computer experience associated with subjects' attitudes toward the perceived usefulness of computers? *Journal of Research on Computing in Education, 21*(4), 401-410.

Chen, M. (1986). Gender and computers: The beneficial effects of experience on attitudes. *Journal of Educational Computing Research, 2*, 265-282.

Davenport, A. F. (1997). *The Neo-Luddite manifesto.* Retrieved on December 16,2002, fromhttp://www.personal.psu.edu/users/a/f/afd108/neo-ludd.htm

Dille, B. & Mezack, M. (1991). Identifying predictors of high risk among community college telecourse students. *The American Journal of Distance Education, 5*(1), 24-35.

Dyck, J. L. & Al-Awar Smither, J. (1994). Age difference in computer anxiety: The role of computer experience, gender and education. *Journal of Educational Computing Research, 10*(3), 239-248.

Enochs, L. (1984). The effect of computer instruction on general attitudes toward computers of fifth graders. *The Journal of Computers in Mathematics and Science Teaching, 3* (3), 24-25.

Erickson, T. E. (1987). *Sex differences in student attitudes towards computers*. Paper presented at the Annual Meeting of the American Educational Research Association (AERA), Portland, Oregon.

Evan-Andris, M. (1996). *An apple for the teacher*. Thousand Oaks, CA: Corwin.

Fabry, D. L. & Higgs, J.R. (1997). Barriers to the effective use of technology in education: Current status. *Journal of Educational Computing Research, 17*(4), 385-395.

Fennema, E., & Sherman, J. (1977). Sex-related differences in mathematics achievement, spatial visualization and affective factors. *American Educational Research Journal, 14*, 51-71.

George, G. & Camarata, M. R. (1996). Managing instructor cyberanxiety: The role of self-efficacy in decreasing resistance to change. *Educational Technology 36*(4), 49-54.

Grasha, A. F. & Yangarber-Hicks, N. (2000). Integrating teaching styles and learning styles with instructional technology. *College Teaching, 48*(1), 2-9.

Griswold, P. A. (1983). Some determinants of computer awareness among education majors. *Association for Educational Data Systems Journal, 16*(2), 92-103.

Guskey, T. R. (1986). Staff development and the process of teacher change. *Educational Researcher, 15*(5), 5-11.

Henderson, R., Deane, F., Barrelle, K. & Mahar, D. (1995). Computer anxiety: Correlates, norms, and problem definition in health care and banking employees using the computer attitude scale. *Interacting with Computers, 7*(2), 181-193.

Hodas, S. (1996). Technology refusal and the organizational culture of schools. *Educational policy analysis archives, 1*(10), 1-26. Retrieved January 10, 2003, from http://epaa.asu.edu/epaa/v1n10.html

Jacobsen, M. (1997). *Bridging the gap between early adopters' and mainstream faculty's use of instructional technology.* (ERIC Document Reproduction Service No. ED423785)

Jencius, M. (2000a). Appendix 4: Technology competencies matrix. In J. W. Bloom, & G.R.Walz, (Eds). *Cybercounseling and Cyberlearning: Strategies and Resources for the Millennium*, (pp.433-440). Alexandria, VA: American Counseling Association and ERIC/CASS.

Jencius, M. (2000b). *Technology-enhanced instruction: Developing your digital vision.*Retrieved January 2, 2003, from http://cybercounsel.uncg.edu/articals/jencius_cyber_aca.htm

Kluever, R. C., Lam, T. C. M., Hoffman, E. R., Green, K. E., & Swearingen, D. L. (1994). The computer attitude scale: Assessing changes in teachers' attitudes toward computers. *Journal of Educational Computing Research, 11*(3), 251-261.

Levin, T. & Gordon, C. (1989). Effect of gender and computer experience on attitudes toward computers. *Journal of Educational Computing Research, 5*(1), 69-88.

Loyd, B. H. & Gressard, C. (1984a). Reliability and factorial validity of computer attitude scale. *Educational and Psychological Measurement, 44*, 501-505.

Loyd, B. H. & Gressard, C.P. (1984b). The effects of sex, age and computer experience on computer attitudes. *Association for Educational Data Systems Journal, 18*(2), 67-77.

Loyd, B. H., & Loyd, D. E. (1985). The reliability and validity of an instrument for the assessment of computer attitudes. *Educational and Psychological Measurement, 45*, 903-908.

Loyd, B. H. & Gressard, C. P. (1986). Gender and amount of computer experience of teachers in staff development programs: Effects on computer attitude and perceptions of the usefulness of computers. *Association of Educational Data Systems Journal, 18*(4), 303-311.

Marcinkiewicz, H.R. (1994). Differences in computer use of practicing versus pre-service teachers. *Journal of Research on Computing in Education, 27*(2), 66-70.

Marshall, J. C. & Bannon, S.H. (1986). Computer attitude and computer knowledge of students and educators. *Association of Educational Data Systems Journal, 18*(4), 270-286.

Martin, P. C. (1996). Technology leadership: Moving beyond the photocopies. *Educational Considerations, 23*(2), 29-31.

Massoud, S. L. (1991). Computer attitudes and computer knowledge of adult students. *Journal of Educational Computing Research, 7*(3), 269-291.

Means, B. & Olson, K. (1995). *Restructuring schools with technology: Challenges and strategies.* SRI International.

Misfeldt, R. & Stahl, W. A. (1991). *Attitudes towards computerization in Canadian universities* (Tech. Rep. No. 4). Ottawa, Ontario, Canada: Canadian International Development Agency. (ERIC Document Reproduction Service No. ED 338 229)

Montag, M., Simonson, M. R. & Maurer, M. (1984). *Manual for the standardized test of computer literacy and the computer anxiety index.* Iowa State University Research Foundation, Inc.

Morrell, P. D. (1992). The effects of computer-assisted instruction and students' achievement in high school biology. *School Science and Mathematics, 92,* 177-181.

Nash, J. B. & Moroz, P. A. (1997). An examination of the factor structures of the computer attitude scale. *Journal of Educational Computing Research, 17*(4), 341-356.

Norales, F. O. (1987). Postsecondary students' attitudes towards computers. *Journal of Computer Information Systems,* 15-20.

Olsen, F. (1999). Faculty wariness of technology remains a challenge, computing survey finds. *The Chronicle of Higher Education 46*(10), A65.

Parker, D.R. (1997). Increasing faculty use of technology in teaching and teacher education. *Journal of Technology and Teacher Education, 5*(2/3), 105-115.

Paul, D. (1994). An integration/inservice model that works. *T.H.E. Journal, 21*(9), 60-62.

Pope-Davis, D.B. & Twing, J.S. (1991). The effects of age, gender and experience on measures of attitude regarding computers. *Computer in Human Behavior, 7*, 333-339.

Pope-Davis, D.B. & Vispoel, W.P. (1993). How instruction influences attitudes of college men and women toward computers. *Computers in Human Behavior, 9*(1), 83-93.

Quick, D. & Davies, T.G. (1999). Community college faculty development: Bringing technology into instruction. *Community College Journal of Research and Practice, 23*, 641-653.

Raub, A. C. (1981). *Correlates of computer anxiety in college students*. Unpublished dissertation, University of Pennsylvania.

Reece, M. J. & Gable, R. K. (1982). The development and validation of a measure of general attitudes toward computers. *Educational and Psychological Measurement, 42*, 913-916.

Rogers, E. M. (1995). *Diffusion of Innovations* (4th ed.). New York: Free Press.

Ross, J. L., & Schulz, R. A. (1999). Using the World Wide Web to accommodate diverse learning styles. *College Teaching, 47*(4), 123-29.

Roszkowski, M. J., Devlin, S.J., Snelbecker, G.E., Aiken, R.M., & Jacobson. (1988). Validity and temporal stability issues regarding two measures of computer aptitudes and attitudes. *Educational & Psychological Measurement, 48*(4), 1029-1035.

Ryder, M. (2003). *Luddism and the Neo-Luddite reaction.* Retrieved on January, 3, 2003, from http://carbon.cudenver.edu/~mryder/itc/luddite.html

Shashaani, L. (1994). Gender-differences in computer experience and its influence on computer attitudes. *Journal of Education Computing Research, 11*(4), 347-367.

Spotts, T. H. & Bowman, M. A. (1993). Increasing faculty use of instructional technology: Barriers and incentives. *Educational Media International, 30,* 199-204.

Stanage, K. (1996). The principal as the technology leader. *Educational Considerations, 23*(2), 32-35.

Stanley, R. B., Lindauer, P. & Petrie, G. (1998). Factors that increase teachers' use of computer technology. *ERS Spectrum*, 42-46.

Stevens, D. J. (1980). How educators perceive computers in the classroom. *Association for Educational Data Systems Journal*, 221-232.

Stone, W. H., Thompson, S. D. & Lacount, D. M. (1989). Attitudes of high school counselors towards computers. *School Counselor, 36*(4), 281-285.

Swadener, M. & Hannafin, M. (1987). Gender similarities and differences in sixth graders' attitudes toward computers: An exploratory study. *Educational Technology, 27*(1), 37-42.

Thompson, E. P. (1966). *The Making of the English Working Class*. New York: Vintage.

Wedman, J. & Strathe, M. (1985). Faculty development in technology: A model for higher education. *Educational Technology, 25*(2), 15-19.

Wilson, R. F., Jencius, M. & Duncan, D. (1997). Introduction to the Internet: Opportunities and dilemmas. *Counseling and Human Development, 29*(6), 1-16.

Woodrow, J. E. (1991). A comparison of four computer attitude scales. *Journal of Educational Computing Research, 7(2)*, 165-187.

Woodrow, J. E. J. (1994). The development of computer-related attitudes of secondary students. *Journal of Educational Computing Research, 11*(4), 307-338.

Young, E. B. (1991). Empowering teachers to use technology in their classroom. *Computers in the Schools, 8*, 143-145.

Computer Attitude Scales

Title	Author(s)	Description	Constructs Observed	Reference Source	Original Location
Computer Attitude Scale (CAS)	Loyd & Gressard (1984)	The second version of the CAS is a Likert-type instrument that consists of 40 items which contain statements regarding attitudes toward computers and the use of them.	Confidence, computer liking, computer anxiety and perceived usefulness of computers	Loyd, B.H., & Loyd, D.E. (1985). The reliability and validity of an instrument for the assessment of computer attitudes. *Educational and psychological measurement, 45*, 903-908.	Loyd, B.H., & Loyd, D.E. (1985). The reliability and validity of an instrument for the assessment of computer attitudes. *Educational and psychological measurement, 45*, 903-908.
Affective Attitude Measure	Levin & Gordon (1989)	Measure contains eighteen items which reflect affective reactions to characteristics of computers.	General	Levin, T., & Gordon, C. (1989). Effect of gender and computer experience on attitudes toward computers. *Journal of educational computing research, 5(1)*, 69-88.	Levin, T., & Gordon, C. (1989). Effect of gender and computer experience on attitudes toward computers. *Journal of educational computing research, 5(1)*, 69-88.

Attitude Survey	Misfelt & Stahl (1991)	Survey consists of 30 questions based on a 5-point Likert Scale used to determine attitudes toward computerization.	Pedagogy, administration, equality and social impact	Hayes, B.G., & Robinson, E.H. III (2000). Assessing counselor education students' attitudes toward computers and multimedia instruction. *Journal of humanistic counseling, education and development, 38(3)*, 132-141.	Misfelt, R., & Stahl, W.A. (1991). Attitudes towards computerization in Canadian universities (Tech. Rep. No. 4). Ottawa, Ontario, Canada: Canadian International Development Agency. (ERIC Document Reproduction Service No. ED 338 229)
Attitude Toward Computers (ATC)	Raub (1981)	Survey consists of 25 questions used to assess computer anxiety, defined by the author as a form of "state anxiety" with the computer providing a "personally threatening" stimulus.	Computer anxiety, impact of computers on society, and computer appreciation	Gardner, D.G., Discenza, R., & Dukes, R.L. (1993). The measurement of computer attitudes: An empirical comparison of available scales. *Journal of educational computing research, 9(4)*, 487-507.	Raub, A.C. (1981). Correlates of computer anxiety in college students. Unpublished dissertation, University of Pennsylvania.

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Bloomberg-Erikson-Lowrey Computer Attitude Task (BELCAT)	Erickson (1987)	Instrument is a Likert-type self-report measure of attitude toward learning about computers and toward computers based on Mathematics Attitude Scale (Fennema & Sherman, 1977)	Computer liking, comfort with computers, usefulness of computers, attitudes toward success with computers, and computers as a male domain	Gardner, D.G., Discenza, R., & Dukes, R.L. (1993). The measurement of computer attitudes: An empirical comparison of available scales. *Journal of educational computing research, 9(4)*, 487-507.	Erickson, T.E. (1987). Sex differences in student attitudes towards computers. Paper presented at the Annual Meeting of the American Educational Research Association (AERA), Portland, Oregon.
Computer Anxiety Index (CAIN)	Maurer (1983)	Scale examines avoidance of, negative attitudes toward, caution with, and disinterest in computers.	Computer anxiety	Gardner, D.G., Discenza, R., & Dukes, R.L. (1993). The measurement of computer attitudes: An empirical comparison of available scales. *Journal of educational computing research, 9(4)*, 487-507.	Montag, M., Simonson, M.R., & Maurer, M. (1984). Manual for the standardized test of computer literacy and the computer anxiety index. Iowa State University Research Foundation, Inc.

Computer Assisted Instruction (CAI)	Morrell (1992)	Survey composed of 20 responses to be answered on a scale of 1 to 5, with choices ranging from strongly agree to strongly disagree.	Attitude	Hayes, B.G., & Robinson, E.H. III (2000). Assessing counselor education students' attitudes toward computers and multimedia instruction. *Journal of humanistic counseling. education and development, 38(3)*, 132-141.	Morrell, P.D. (1992). The effects of computer-assisted instruction of students' achievement in high school biology. *School science and mathematics. 92. 177-181.*
Computer Attitude Scale	Byrd & Koohang (1989)	Contains twelve items.	Computer usefulness	Woodrow, J.E.J. (1991). A comparison of four computer attitudes scales. *Journal of educational computing research, 7(2)*, 165-187.	Byrd, D.M., & Koohang, A.A. (1989). A professional development question: Is computer experience associated with subjects' attitude toward the perceived usefulness of computers? *Journal of research on computing in education. 21(4)*, 401-410.

Computer Survey	Stevens (1980)	Eleven-item measurement.	Efficacy and anxiety	Woodrow, J.E.J. (1991). A comparison of four computer attitudes scales. *Journal of educational computing research, 7(2)*, 165-187.	Stevens, D.J. (1980). How educators perceive computers in the classroom. *Association for educational data systems journal*, 221-232.
Computer Use Questionnaire	Griswold (1983)	Twenty-item measurement.	Awareness	Woodrow, J.E.J. (1991). A comparison of four computer attitudes scales. *Journal of educational computing research, 7(2)*, 165-187.	Griswold, P.A. (1983). Some determinants of computer awareness among education majors. *Association for educational data systems journal, 16(2)*, 92-103.

General Attitude Measure	Enochs (1984)	Measure consists of twenty-two statements about computers on a Likert-type scale.	Desire to become familiar with the computer, range of capable users, need for computers in our lives, and computer as an instrumental medium.	Levin, T., & Gordon, C. (1989). Effect of gender and computer experience on attitudes toward computers. *Journal of educational computing research, 5(1)*, 69-88.	Enochs, L. (1984). The effect of computer instruction on general attitudes toward computers of fifth graders. *The journal of computers in mathematics and science teaching, 3 (3)*, 24-25.
Minnesota Computer Literacy and Awareness Assessment Instrument (MCLAA)	Anderson, Krohn, & Sandman (1980)	Instrument is a Likert-type measure that consists of 30 items.	Self confidence in the use of computers, perceived utility of computers, general attitude toward computers, and sex roles in computers.	Woodrow, J.E.J. (1991). A comparison of four computer attitudes scales. *Journal of educational computing research, 7(2)*, 165-187.	Anderson, R.E., Krohn, K., & Sandman, R. (1980). User's guide for the Minnesota computer literacy and awareness assessment. St. Paul: Minnesota Educational Computing Corporation.

Perceptions of the Computer's Function Capabilities Questionnaire	Levin & Gordon (1989)	Measure divided into three parts: an Affective Attitude Measure, which contains eighteen semantic differential variables, and two Cognitive Measures that contain a list of twelve tasks divided into four types of computerized activies.	Affective reactions to characteristics of computers, perceptions of the computer's functional capabilities and general attitudes towards computers and their use.	Levin, T., & Gordon, C. (1989). Effect of gender and computer experience on attitudes toward computers. *Journal of educational computing research, 5(1)*, 69-88.	Levin, T., & Gordon, C. (1989). Effect of gender and computer experience on attitudes toward computers. *Journal of educational computing research, 5(1)*, 69-88.
Student Survey	Norales (1987)	Contains twenty items.	Efficacy and usefulness	Woodrow, J.E.J. (1991). A comparison of four computer attitudes scales. *Journal of educational computing research, 7(2)*, 165-187.	Norales, F.O. (1987). Postsecondary students' attitudes towards computers. *Journal of computer information systems*, 15-20.

SURVEY OF ATTITUDES TOWARD LEARNING ABOUT AND WORKING WITH COMPUTERS

Brenda H. Loyd and Clarice P. Gressard
University of Virginia

The purpose of this survey is to gather information concerning people s attitudes toward learning about and working with computers. It should take about five minutes to complete this survey. All responses are kept confidential. Please return the survey to your instructor when you are finished.

Please check the blank which applies to you.

1. Age: 22 or less 23-25 26-30
31-35 36-40 41-45
46-50 51-55 55+

2. College level completed: 1st year 2nd year 3rd year
4th year Bachelors Masters
Doctorate

3. Major area of study: _____

4. Sex: Male Female

5. Experience with learning about or working with computers:
1 week or less 1 week to 1 month 1 month to 6 months
6 months to 1 year 1 year or more

Briefly state the type of computer experience: _____

COMPUTER ATTITUDE SCALE

Below are a series of statements. There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Place a checkmark in the space under the label which is closest to your agreement or disagreement with the statements.

	Strongly Agree	Slightly Agree	Slightly Disagree	Strongly Disagree
1.Computers do not scare me at all.				
2.I'm no good with computers.				
3.I would like working with computers.				
4.I will use computers many ways in my life.				
5.Working with a computer would make me very nervous.				
6.Generally, I would feel OK about trying a new problem on the computer.				
7.The challenge of solving problems with computers does not appeal to me.				
8.Learning about computers is a waste of time.				
9.I do not feel threatened when others talk about computers.				
10.I don't think I would do advanced computer work.				
11.I think working with computers would be enjoyable and stimulating.				
12.Learning about computers is worthwhile.				

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	Strongly Agree	Slightly Agree	Strongly Disagree	Slightly Disagree
13. I feel aggressive and hostile toward computers.				
14. I am sure I could do work with computers.				
15. Figuring out computer problems does not appeal to me.				
16. I'll need a firm mastery of computers for my future work.				
17. It wouldn't bother me at all to take computer courses.				
18. I'm not the type to do well with computers.				
19. When there is a problem with a computer run that I can't immediately solve, I would stick with it until I have the answer.				
20. I expect to have little use for computers in my daily life.				
21. Computers make me feel uncomfortable.				
22. I am sure I could learn a computer language.				
23. I don't understand how some people can spend so much time working with computers and seem to enjoy it.				
24. I can't think of any way that I will use computers in my career.				
25. I would feel at ease in a computer class.				
26. I think using a computer would be very hard for me.				
27. Once I start to work with the computer, I would find it hard to stop.				
28. Knowing how to work with computers will increase my job possibilities.				
29. I get a sinking feeling when I think of trying to use a computer.				
30. I could get good grades in computer courses.				
31. I will do as little work with computers as possible.				
32. Anything that a computer can be used for, I can do just as well some other way.				
33. I would feel comfortable working with a computer.				
34. I do not think I could handle a computer course.				
35. If a problem is left unsolved in a computer class, I would continue to think about it afterward.				
36. It is important to me to do well in computer classes.				
37. Computers make me feel uneasy and confused.				
38. I have a lot of self-confidence when it comes to working with computers.				
39. I do not enjoy talking with others about computers.				
40. Working with computers will not be important to me in my life's work.				

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The survey is scored according to the following:

For questions 1, 3, 4, 6, 9, 11, 12, 14, 16, 17, 19, 22, 25, 27, 28, 30, 33, 35, 36, 38 Strongly Agree=4, Slightly Agree=3, Slightly Disagree=2, Strongly Disagree=1).

For questions 2, 5, 7, 8, 10, 13, 15, 18, 20, 21, 23, 24, 26, 29, 31, 32, 34, 37, 39, 40 Strongly Agree=1, Slightly Agree=2, Slightly Disagree=3, Strongly Disagree=4).

The questions are coded so that the higher the score, the more positive the attitude.

Four subscores can also be obtained from the questions.

Anxiety: 1, 5, 9, 13, 17, 21, 25, 29, 33, 37
Confidence: 2, 6, 10, 14, 18, 22, 26, 30, 34, 38
Liking: 3, 7, 11, 15, 19, 23, 27, 31, 35, 39
Usefulness: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40

Again, higher scores correspond to more positive attitude, e.g., a higher confidence score means more confidence and a higher anxiety score means less anxiety.

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